



# STIC Search Report

## Biotech-Chem Library

STIC Database Tracking Number: 104718

TO: Jeffrey Parkin  
Location: CM1/8E15  
Art Unit: 1648  
Thursday, October 09, 2003  
Case Serial Number: 09549186

*SEI2*

From: Paul Schulwitz  
Location: Biotech-Chem Library  
CM1-6B06  
Phone: 305-1954

[paul.schulwitz@uspto.gov](mailto:paul.schulwitz@uspto.gov)

### Search Notes

Examiner Parkin,

See attached results.

If you have any questions about this search feel free to contact me at any time.

Thank you for using STIC search services!

Paul Schulwitz  
Technical Information Specialist  
STIC Biotech/Chem Library  
(703)305-1954



# STIC SEARCH RESULTS FEEDBACK FORM

## Biotech-Chem Library

Questions about the scope or the results of the search? Contact *the searcher or contact*:

Mary Hale, Information Branch Supervisor  
308-4258, CM1-1E01

## Voluntary Results Feedback Form

➤ I am an examiner in Workgroup:  Example: 1610

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/Biotech-Chem Library GM1 - Circ. Desk



Access DB# 104718  
105698

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: JEFF PARKIN Examiner #: 72607 Date: 09/29/03  
An Unit: 1648 Phone Number: 308-2227 Serial Number: 09/549,186  
Mail Box and Bldg/Room Location: CM01/8E15 Results Format Preferred (circle) PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search the attached, highlighted peptide to see if any IMMUNORETROIDS, RETRO-INVERSO, OR RETROPEPTIDES have been made from the sequence. (FP, FL, +SL peptides). There are modified D-peptides obtained from the FOOT-AND-MOUTH DISEASE VIRUS (FMDV).

RECEIVED  
SEP 29 2003  
SCIENTIFIC & TECHNICAL INFORMATION CENTER (STIC)

2.55-2.59  
(4)  
1089-10.24  
(15)

## STAFF USE ONLY

Searcher: \_\_\_\_\_

Searcher Phone #: \_\_\_\_\_

## Type of Search

NA Sequence (#) \_\_\_\_\_

AA Sequence (#) 3

## Vendors and cost where applicable

STN 158/158

Dialog: \_\_\_\_\_

09/549,186

IMMUNORETROIDS  
RETROINVERSO  
RETROPEPTIDES  
5  
PEPTIDOMIMETICS  
FMDV

"optimum" conformation of a linear sequence, as well as to the rapid degradation of peptides injected into the animal. In the context of the invention, a study of the antigenic and immunogenic properties of retro-inverso (RI) analogues derived from the immunodominant loop of three variants of serotype A12 of FMDV was therefore undertaken. The sequences of these peptides and of the corresponding RI analogues are shown on Table 8 (note: the parent sequence of the peptide studied covers the region 141-159; a cysteine residue is added in the N-terminal position at the end of coupling).

10 TABLE 8

Sequences of synthetic peptides (region 141-159) derived from the immunodominant loop of three variants of serotype A12 of the virus of aphthous fever (FMDV).

15

FP peptide C-G<sup>141</sup>-S-G-V-R-G-D-F-G-S-L-A-P-R-V-A-R-Q-L<sup>159</sup>  
(strain USA) (SEQ ID NO:7)

20

FL peptide C-G<sup>141</sup>-S-G-V-R-G-D-F-G-S-L-A-L-R-V-A-R-Q-L<sup>159</sup>  
(SEQ ID NO:8)

SL peptide C-G<sup>141</sup>-S-G-V-R-G-D-S-G-S-L-A-L-R-V-A-R-Q-L<sup>159</sup>  
(strain A) (SEQ ID NO:9)

Sequences of the corresponding retro-inverso analogues

25

HO-m(R or S)Leu-q-r-a-v-r-(\*)-a-l-s-G-(\*\*)-d-G-r-v-G-s-G-c-NH<sub>2</sub>

(\*\*) : f f s

(\*) : p l l

30

The study is divided into 3 parts:

1) Study of the antigenic properties of the analogues.

35

Sera of guinea-pigs immunized against the virus ("antivirion"), protein VP<sub>1</sub> ("anti-protein VP<sub>1</sub>"), against peptide 141-159 (variant USA; "anti-FP peptide") and serum originating from guinea-pigs infected with the virus ("convalescent") are available. Normal serum (negative batch) of the guinea-pig serves as a control. The results are shown on Table 9. The two RIa and RIb

=> d que 14

L1 2 SEA FILE=REGISTRY ABB=ON PLU=ON CGSGVRGDFGSLAPRVARQL/SQSP  
L2 0 SEA FILE=REGISTRY ABB=ON PLU=ON CGSGVRGDFGSLALRVARQL/SQSP  
L3 0 SEA FILE=REGISTRY ABB=ON PLU=ON CGSGVRGDSGSLALRVARQL/SQSP  
L4 3 SEA FILE=HCAPLUS ABB=ON PLU=ON L1 OR L2 OR L3

*Sequence search on STN*

=> d ibib abs ind hitstr 14 1-3

L4 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2003:489994 HCAPLUS

DOCUMENT NUMBER: 139:83614

TITLE: Intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and protection against challenge

AUTHOR(S): Fischer, D.; Rood, D.; Barrette, R. W.; Zuwallack, A.; Kramer, E.; Brown, F.; Silbart, L. K.

CORPORATE SOURCE: Center of Excellence for Vaccine Research, University of Connecticut, Storrs, CT, USA

SOURCE: Journal of Virology (2003), 77(13), 7486-7491

CODEN: JOVIAM; ISSN: 0022-538X

PUBLISHER: American Society for Microbiology

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Guinea pigs immunized intranasally with a keyhole limpet hemocyanin-linked peptide, corresponding to the prominent G-H loop of the VP1 protein of foot-and-mouth disease virus, raised substantial levels of antipeptide and virus-neutralizing antibodies in sera and of peptide-specific secretory IgA in nasal secretions. In groups of animals immunized intranasally without adjuvant, 86 percent were fully protected upon challenge with homotypic virus. Surprisingly, animals given the peptide conjugates plus the mucosal adjuvant cholera toxin were afforded only partial protection in that primary lesions were obsd. in most animals, although spread to other feet was prevented. These results indicate that intranasal inoculation with the peptide offers a potential route of vaccination against foot-and-mouth disease and may be useful for eliciting protection in the upper respiratory tracts of susceptible animals.

CC 15-2 (Immunochemistry)

ST foot mouth disease virus vaccination vaccine nose VP1

IT Immunoglobulins

RL: BSU (Biological study, unclassified); BIOL (Biological study) (A, secretory; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)

IT Proteins

RL: BSU (Biological study, unclassified); BIOL (Biological study) (VP1; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus VP1 peptide conjugate induces mucosal and humoral antibodies and immune protection)

IT Immunostimulants

(adjuvants; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)

IT Toxins

RL: PAC (Pharmacological activity); BIOL (Biological study) (cholera; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)

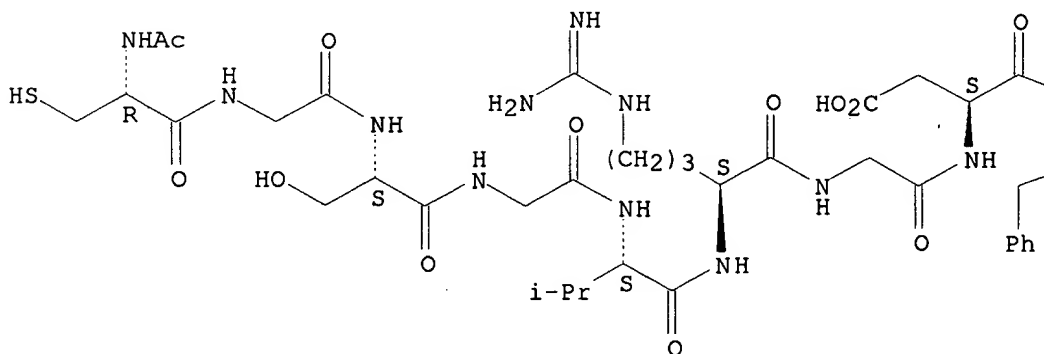
IT Disease, animal

(foot-and-mouth disease; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)

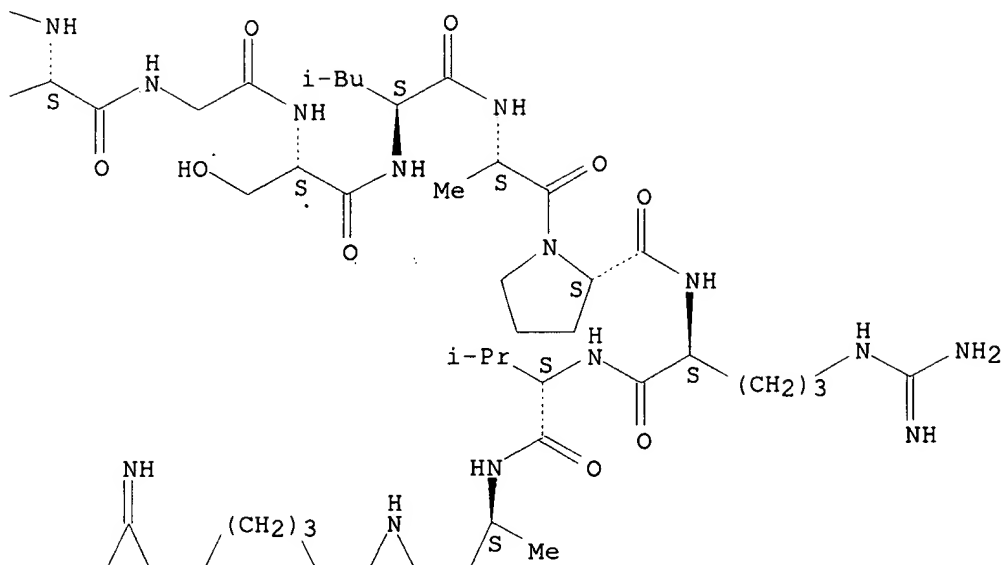
- IT Foot-and-mouth disease virus  
 Immunity  
 Nose  
 Vaccines  
 (intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)
- IT Antibodies  
 RL: BSU (Biological study, unclassified); BIOL (Biological study)  
 (neutralizing; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)
- IT Immunization  
 (vaccination, intranasal; intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)
- IT **199790-86-8D**, conjugates with carrier protein  
 RL: PAC (Pharmacological activity); BIOL (Biological study)  
 (intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)
- IT **199790-86-8D**, conjugates with carrier protein  
 RL: PAC (Pharmacological activity); BIOL (Biological study)  
 (intranasal immunization of guinea pigs with an immunodominant foot-and-mouth disease virus peptide conjugate induces mucosal and humoral antibodies and immune protection)
- RN 199790-86-8 HCAPLUS
- CN L-Leucine, N-acetyl-L-cysteinyglycyl-L-serylglycyl-L-valyl-L-arginylglycyl-L-.alpha.-aspartyl-L-phenylalanylglycyl-L-seryl-L-leucyl-L-alanyl-L-prolyl-L-arginyl-L-valyl-L-alanyl-L-arginyl-L-glutamyl- (9CI)  
 (CA INDEX NAME)

Absolute stereochemistry.

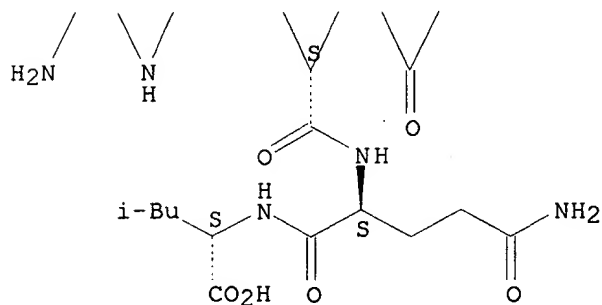
PAGE 1-A



PAGE 1-B



PAGE 2-B



REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1998:597752 HCAPLUS

DOCUMENT NUMBER: 129:342490

TITLE: Mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers: a new approach in the design of peptide based vaccines

AUTHOR(S): Guichard, Gilles; Benkirane, Nadia; Briand, Jean-Paul; Muller, Sylviane; Van Regenmortel, Marc H. V.; Newman, John F. E.; Brown, Fred

CORPORATE SOURCE: Institut de Biologie Moleculaire et Cellulaire, UPR 9021 CNRS, Strasbourg, 67000, Fr.

SOURCE: Peptides 1996, Proceedings of the European Peptide



Symposium, 24th, Edinburgh, Sept. 8-13, 1996 (1998),  
Meeting Date 1996, 447-448. Editor(s): Ramage,  
Robert; Epton, Roger. Mayflower Scientific:  
Kingswinford, UK.  
CODEN: 66RCA5

DOCUMENT TYPE:

Conference

LANGUAGE:

English

AB The retro-inverso analog of the immunodominant epitope 141-159 of the VP1 protein of foot-and-mouth disease virus was shown to induce in rabbits a peptide-specific neutralizing IgG response of much higher titer which lasted longer than that induced by the epitope.

CC 15-2 (Immunochemistry)

ST FMDV epitope retro inverso peptide neutralizing IgG

IT Immunoglobulins

RL: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)  
(G, neutralizing; mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT Proteins, specific or class

RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(VP1; mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT Epitopes

Foot-and-mouth disease virus

(mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT Peptides, biological studies

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)

(retro-inverso; mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT Vaccines

(synthetic; mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT 199790-79-9 199790-81-3 199790-86-8 215603-35-3

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)

(mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

IT 199790-81-3 199790-86-8

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)

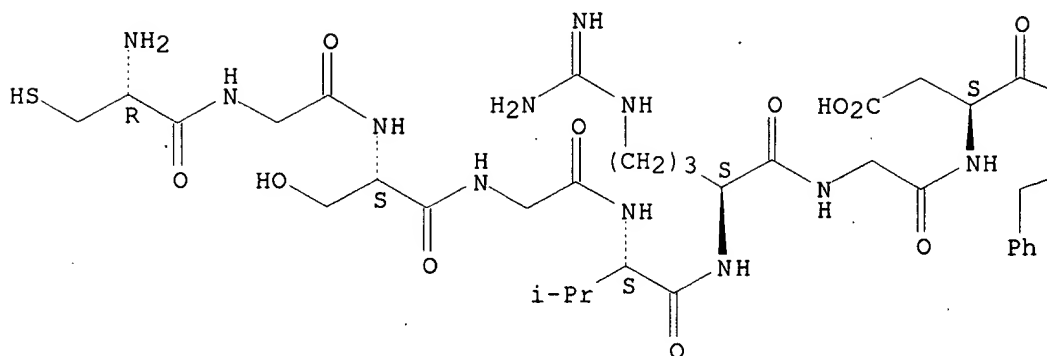
(mimicry of an immunodominant epitope of foot and mouth disease virus with retro-inverso isomers and induction of neutralizing antibodies)

RN 199790-81-3 HCAPLUS

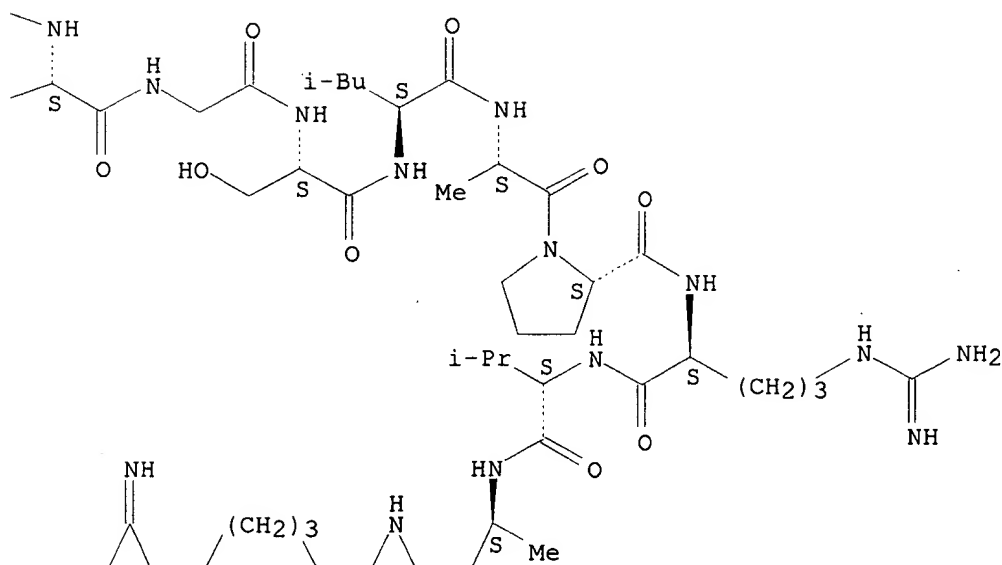
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Absolute stereochemistry.

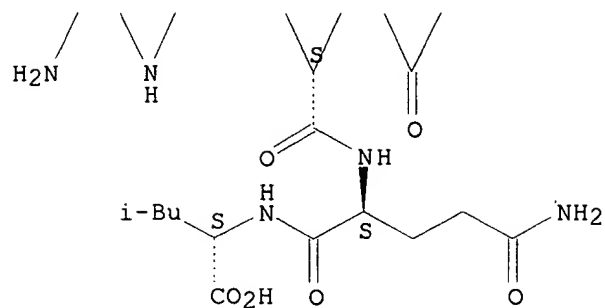
PAGE 1-A



PAGE 1-B



PAGE 2-B

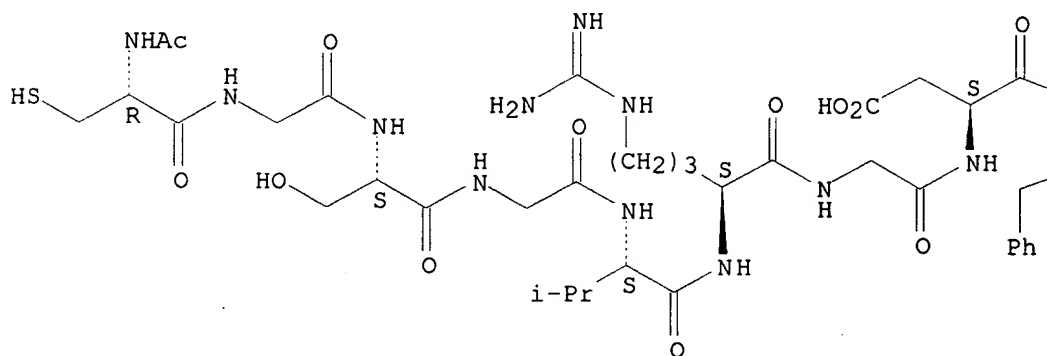


RN 199790-86-8 HCAPLUS

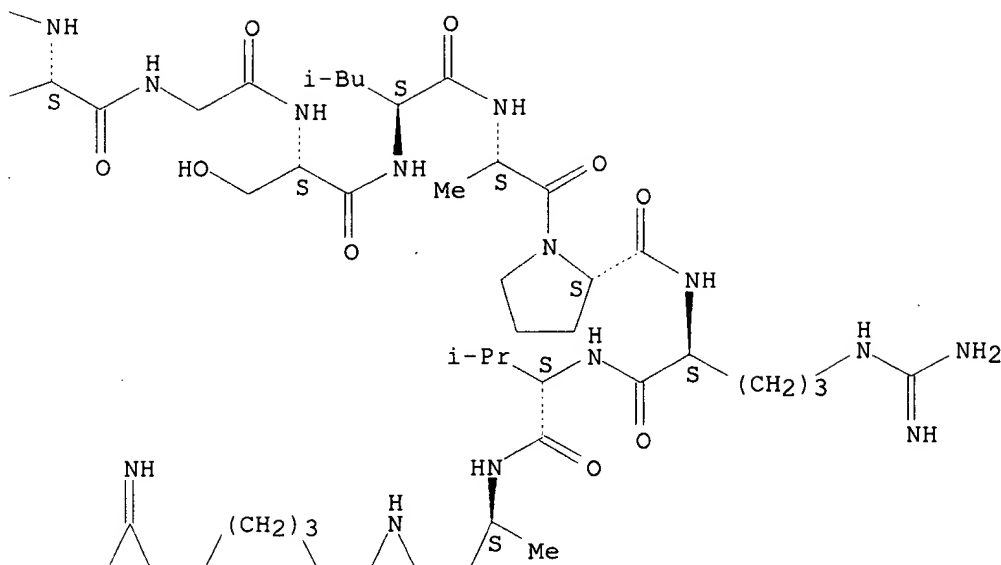
CN L-Leucine, N-acetyl-L-cysteinylglycyl-L-serylglycyl-L-valyl-L-  
 arginylglycyl-L-.alpha.-aspartyl-L-phenylalanylglycyl-L-seryl-L-leucyl-L-  
 alanyl-L-prolyl-L-arginyl-L-valyl-L-alanyl-L-arginyl-L-glutamyl- (9CI)  
 (CA INDEX NAME)

Absolute stereochemistry.

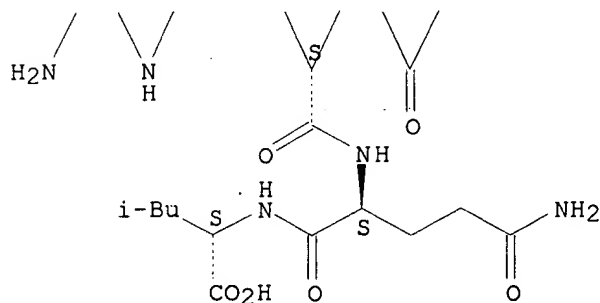
PAGE 1-A



PAGE 1-B



PAGE 2-B



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:768652 HCAPLUS

DOCUMENT NUMBER: 128:33517

TITLE: A retro-inverso peptide corresponding to the GH loop of foot-and-mouth disease virus elicits high levels of long-lasting protective neutralizing antibodies

AUTHOR(S): Briand, Jean-Paul; Benkirane, Nadia; Guichard, Gilles; Newman, John F. E.; Van Regenmortel, Marc H. V.; Brown, Fred; Muller, Sylviane

CORPORATE SOURCE: Unite Propre de Recherche 9021, Centre National de la Recherche Scientifique, Institut de Biologie Moleculaire et Cellulaire, Strasbourg, 67084, Fr.

SOURCE: Proceedings of the National Academy of Sciences of the United States of America (1997), 94(23), 12545-12550  
CODEN: PNASA6; ISSN: 0027-8424

PUBLISHER: National Academy of Sciences

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Peptides corresponding to the immunodominant loop located at residues 135-158 on capsid protein VP1 of foot-and-mouth disease virus (FMDV) generally elicit high levels of anti-peptide and virus-neutralizing antibodies. In some instances, however, the level of neutralizing antibodies is low or even negligible, even though the level of anti-peptide antibodies is high. The authors have shown previously that the antigenic activity of peptide 141-159 of VP1 of a variant of serotype A can be mimicked by a retro-inverso (all-D retro or retroenantio) peptide analog. This retro-inverso analog induced greater and longer-lasting antibody titers than did the corresponding L-peptide. The authors now show that a single inoculation of the retro-inverso analog elicits high levels of neutralizing antibodies that persist longer than those induced against the corresponding L-peptide and confer substantial protection in guinea pigs challenged with the cognate virus. In view of the high stability to proteases of retro-inverso peptide analogs and their enhanced immunogenicity, these results have practical relevance in designing potential peptide vaccines.

CC 15-2 (Immunochemistry)

ST retroinverso peptide foot mouth disease virus; neutralizing antibody vaccine foot mouth disease

IT Proteins, specific or class  
RL: BSU (Biological study, unclassified); BIOL (Biological study) (VP1; retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

IT Antibodies  
RL: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative) (neutralizing; retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

IT Foot-and-mouth disease virus  
Peptidomimetics  
Vaccines  
(retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

IT Peptides, biological studies  
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study) (retro-inverso; retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

IT 164259-71-6 199790-79-9 **199790-81-3** 199790-82-4  
199790-83-5 199790-84-6 **199790-86-8** 199790-89-1  
199790-90-4  
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study) (retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

IT 199790-81-3 199790-86-8

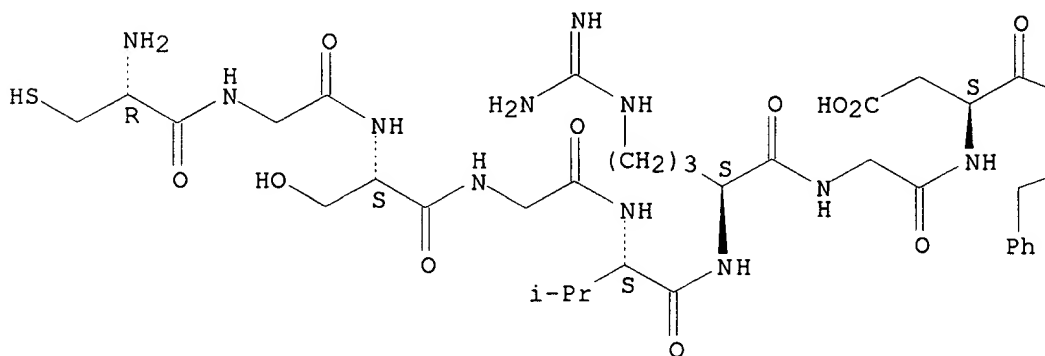
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)  
 (retro-inverso peptide corresponding to GH loop of foot-and-mouth disease virus elicitation of protective neutralizing antibodies in relation to vaccine)

RN 199790-81-3 HCAPLUS

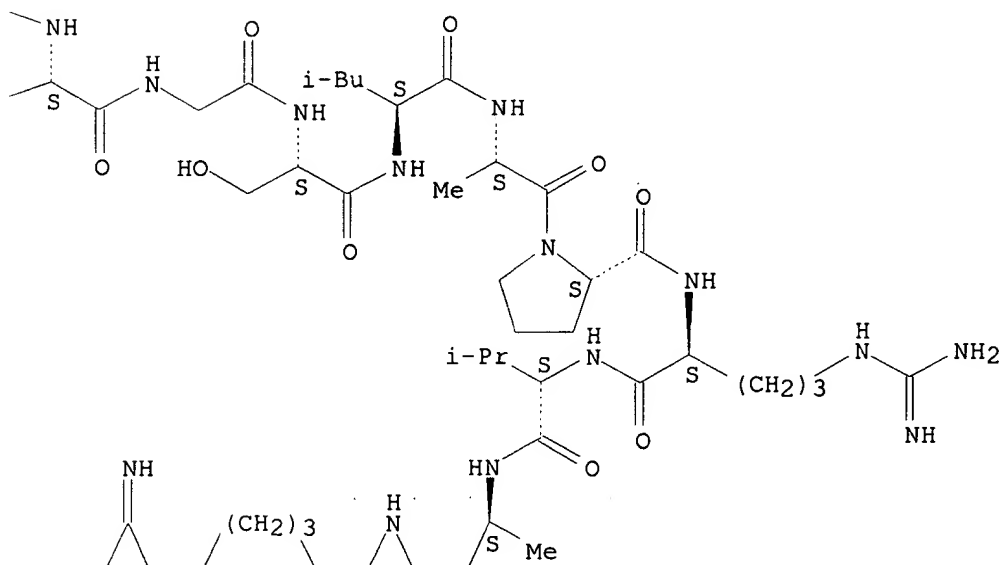
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 arginyl-L-valyl-L-alanyl-L-arginyl-L-glutamyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

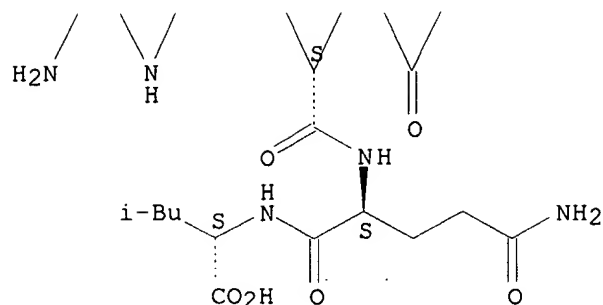
PAGE 1-A



PAGE 1-B



PAGE 2-B

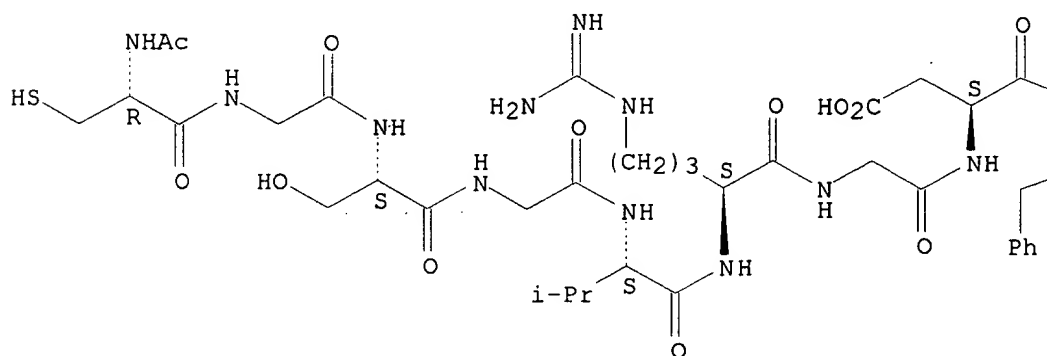


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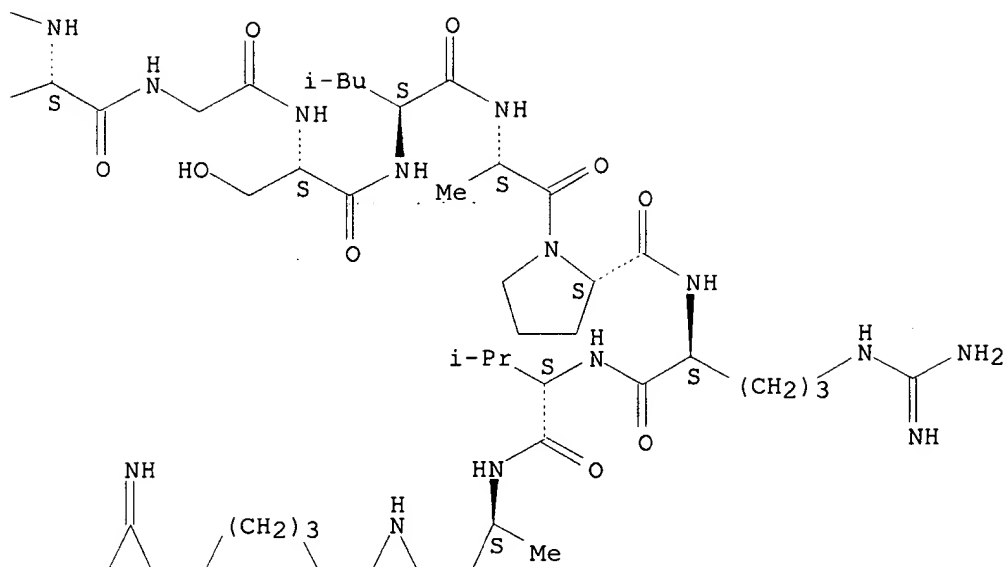
CN L-Leucine, N-acetyl-L-cysteinylglycyl-L-serylglycyl-L-valyl-L-  
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 (CA INDEX NAME)

Absolute stereochemistry.

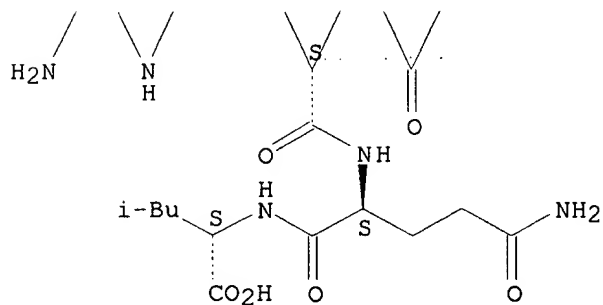
PAGE 1-A



PAGE 1-B



PAGE 2-B



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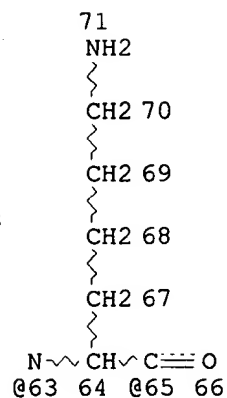
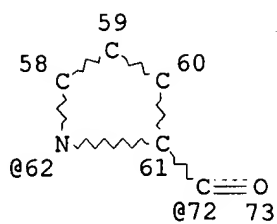
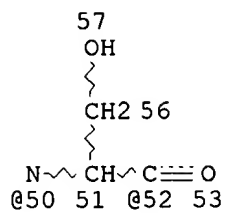
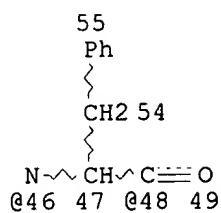
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THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT



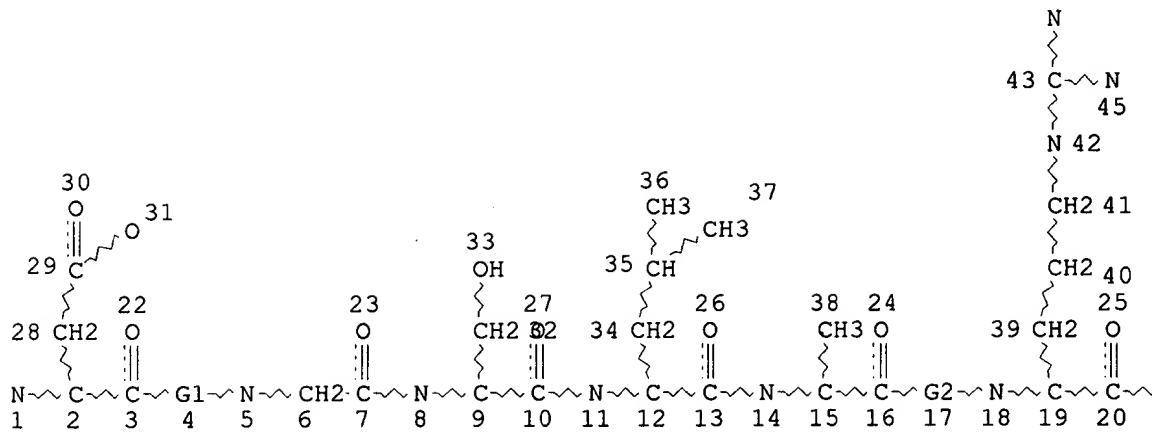
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L5

STR



44

Page 1-A



Page 2-A

~N  
21

Page 2-B

VAR G1=46-3 48-5/50-3 52-5

VAR G2=62-16 72-18/63-16 65-18

## NODE ATTRIBUTES:

CONNECT IS E2 RC AT 1  
CONNECT IS E3 RC AT 2  
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CONNECT IS E1 RC AT 45  
CONNECT IS E2 RC AT 58  
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CONNECT IS E2 RC AT 60  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

*Structurally searched sequence for:*

*open - D-(F/S)-G-S-L-A-(P/L)-R - open*

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 73

## STEREO ATTRIBUTES: NONE

L7 21 SEA FILE=REGISTRY SSS FUL L5  
L8 26 SEA FILE=HCAPLUS ABB=ON PLU=ON L7  
L11 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L8 AND FOOT? AND (IMMUNORET?  
OR RETR?)

=> d ibib abs hitstr l11 1-6

L11 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1998:597752 HCAPLUS

DOCUMENT NUMBER: 129:342490

TITLE: Mimicry of an immunodominant epitope of **foot**  
and mouth disease virus with **retro**-inverso  
isomers: a new approach in the design of peptide based  
vaccines

AUTHOR(S): Guichard, Gilles; Benkirane, Nadia; Briand, Jean-Paul;  
Muller, Sylviane; Van Regenmortel, Marc H. V.; Newman,  
John F. E.; Brown, Fred

CORPORATE SOURCE: Institut de Biologie Moleculaire et Cellulaire, UPR  
9021 CNRS, Strasbourg, 67000, Fr.

SOURCE: Peptides 1996, Proceedings of the European Peptide  
Symposium, 24th, Edinburgh, Sept. 8-13, 1996 (1998),  
Meeting Date 1996, 447-448. Editor(s): Ramage,  
Robert; Epton, Roger. Mayflower Scientific:  
Kingswinford, UK.

CODEN: 66RCA5

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The **retro**-inverso analog of the immunodominant epitope 141-159 of the VP1 protein of **foot**-and-mouth disease virus was shown to induce in rabbits a peptide-specific neutralizing IgG response of much higher titer which lasted longer than that induced by the epitope.

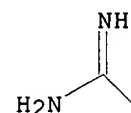
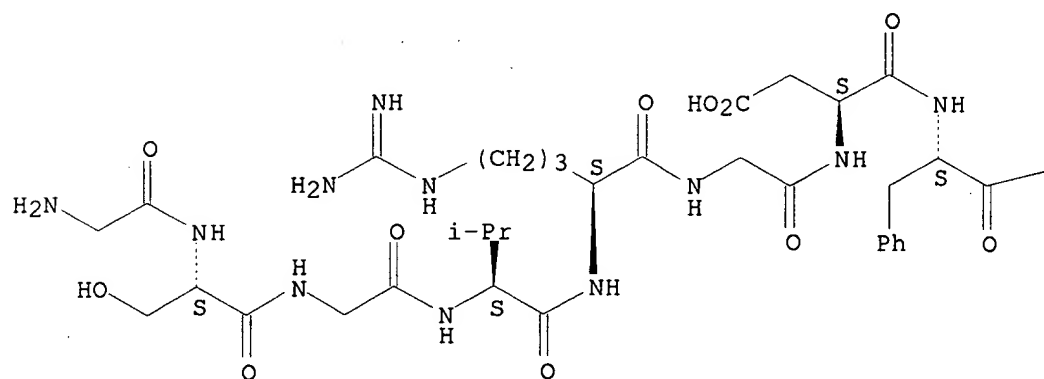
IT **199790-79-9 199790-81-3 199790-86-8**  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
 (mimicry of an immunodominant epitope of **foot** and mouth disease virus with **retro**-inverso isomers and induction of neutralizing antibodies)

RN 199790-79-9 HCAPLUS

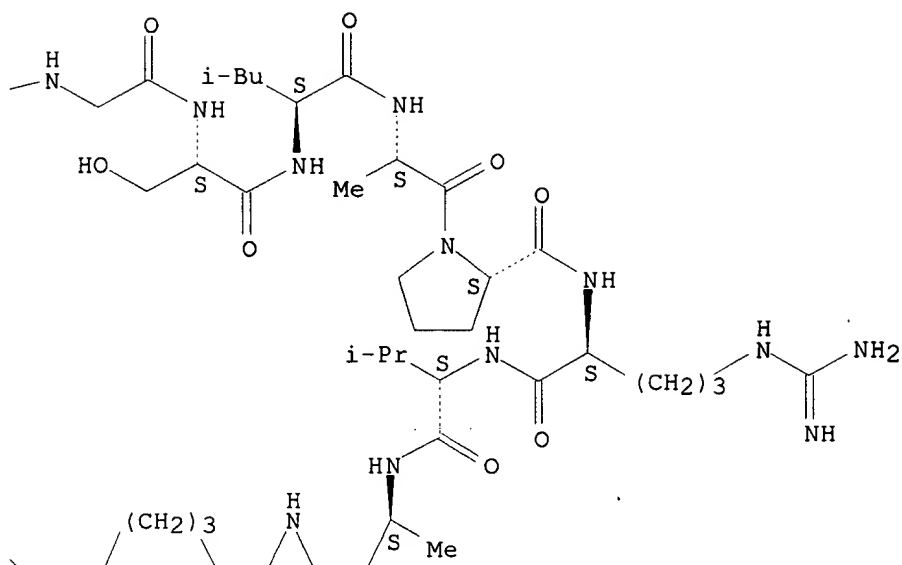
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Absolute stereochemistry.

PAGE 1-A



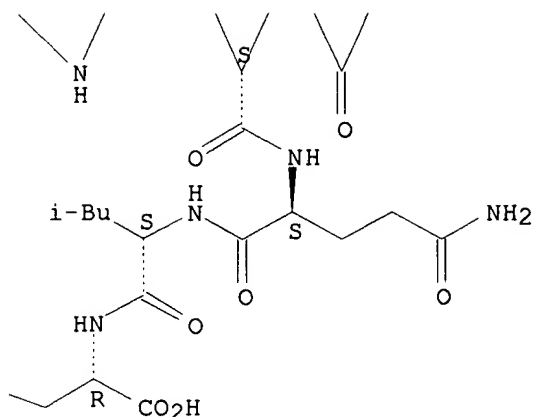
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PAGE 2-A

HS

PAGE 2-B

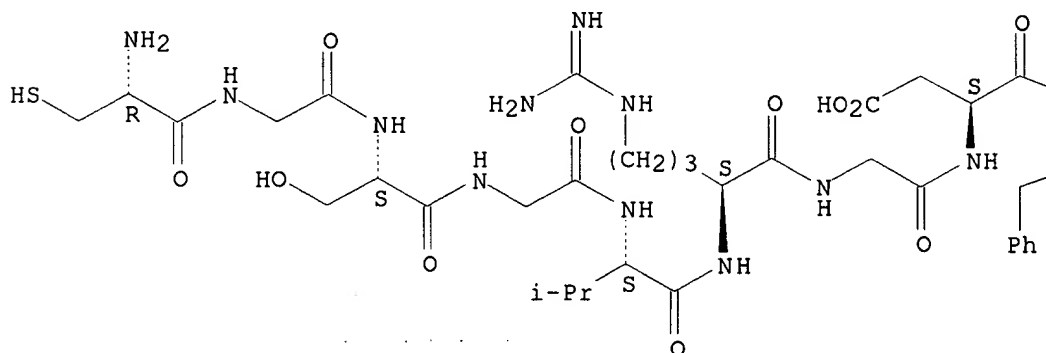


RN 199790-81-3 HCAPLUS

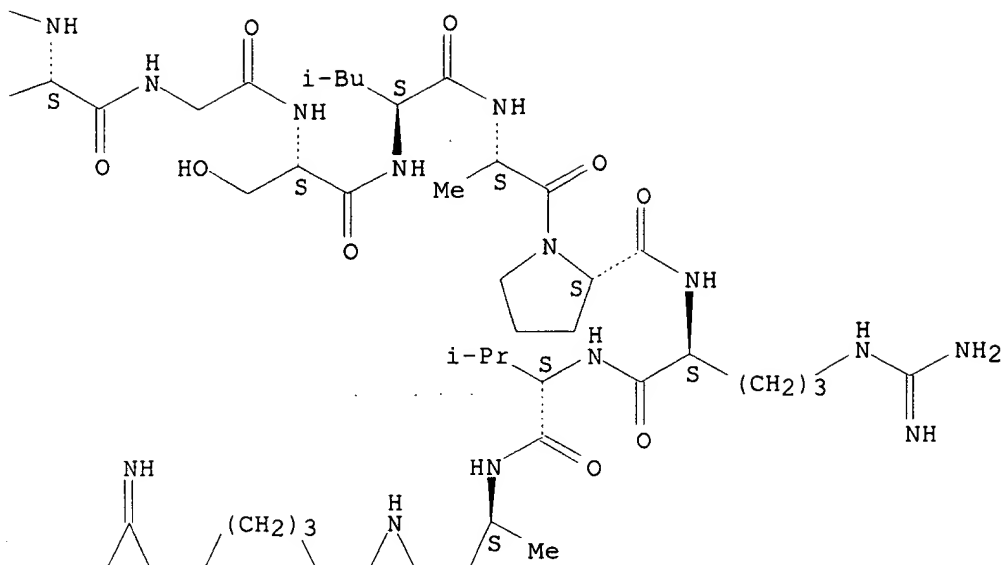
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Absolute stereochemistry.

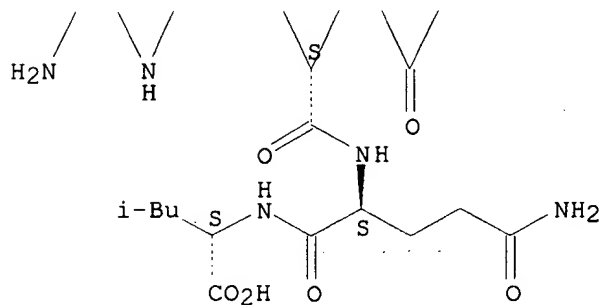
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PAGE 1-B



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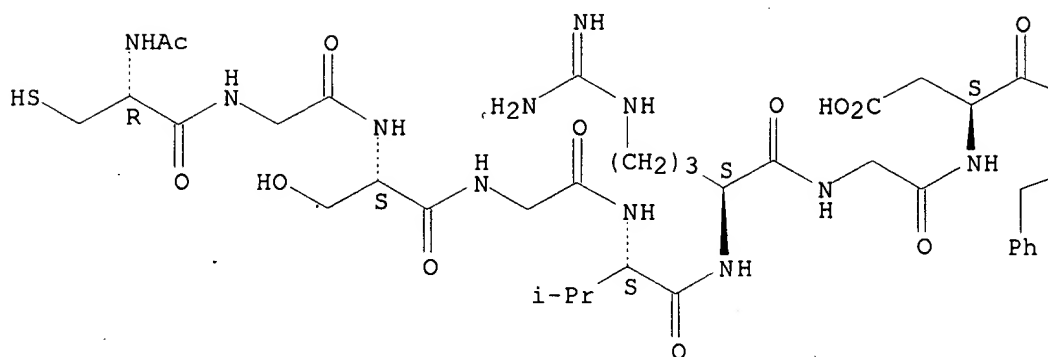


RN 199790-86-8 HCAPLUS

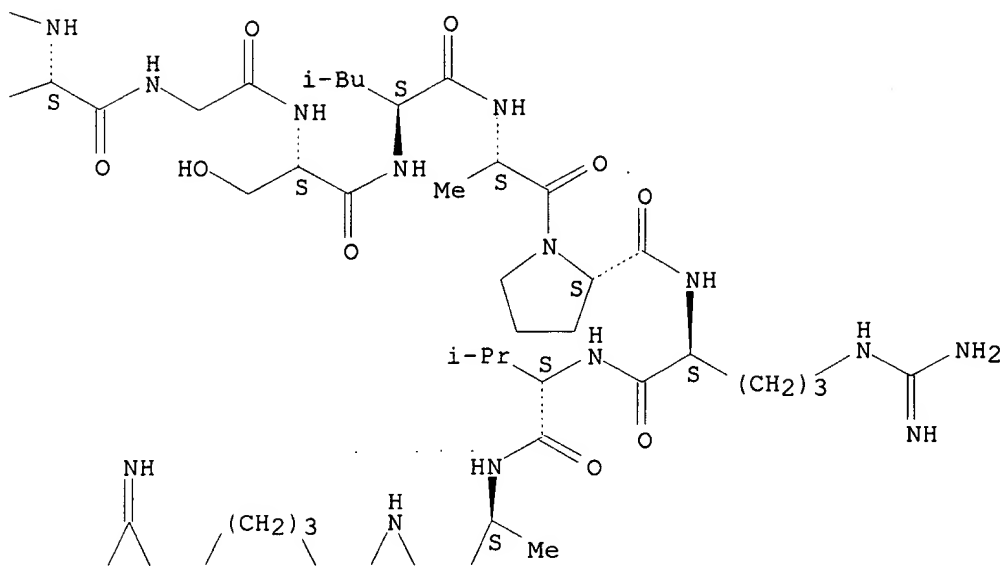
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(CA INDEX NAME)

Absolute stereochemistry.

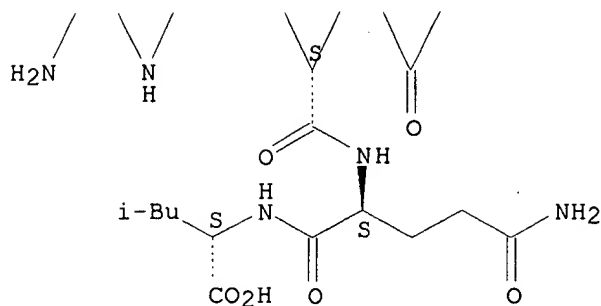
PAGE 1-A



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PAGE 2-B



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 6 HCAPLUS. COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:768652 HCAPLUS

DOCUMENT NUMBER: 128:33517

TITLE: A **retro**-inverso peptide corresponding to the GH loop of **foot**-and-mouth disease virus elicits high levels of long-lasting protective neutralizing antibodies

AUTHOR(S): Briand, Jean-Paul; Benkirane, Nadia; Guichard, Gilles; Newman, John F. E.; Van Regenmortel, Marc H. V.; Brown, Fred; Muller, Sylviane

CORPORATE SOURCE: Unite Propre de Recherche 9021, Centre National de la Recherche Scientifique, Institut de Biologie Molculaire et Cellulaire, Strasbourg, 67084, Fr.

SOURCE: Proceedings of the National Academy of Sciences of the United States of America (1997), 94(23), 12545-12550  
CODEN: PNASA6; ISSN: 0027-8424

PUBLISHER: National Academy of Sciences

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Peptides corresponding to the immunodominant loop located at residues 135-158 on capsid protein VP1 of **foot**-and-mouth disease virus (FMDV) generally elicit high levels of anti-peptide and virus-neutralizing antibodies. In some instances, however, the level of neutralizing antibodies is low or even negligible, even though the level of anti-peptide antibodies is high. The authors have shown previously that the antigenic activity of peptide 141-159 of VP1 of a variant of serotype A can be mimicked by a **retro**-inverso (all-D **retro** or **retroenantio**) peptide analog. This **retro**-inverso analog induced greater and longer-lasting antibody titers than did the corresponding L-peptide. The authors now show that a single inoculation of the **retro**-inverso analog elicits high levels of neutralizing antibodies that persist longer than those induced against the corresponding L-peptide and confer substantial protection in guinea pigs challenged with the cognate virus. In view of the high stability to proteases of **retro**-inverso peptide analogs and their enhanced immunogenicity, these results have practical relevance in designing potential peptide vaccines.

IT 164259-71-6 199790-79-9 199790-81-3

199790-82-4 199790-83-5 199790-86-8

RL: BAC (Biological activity or effector, except adverse); BSU (Biological



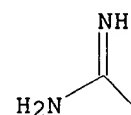
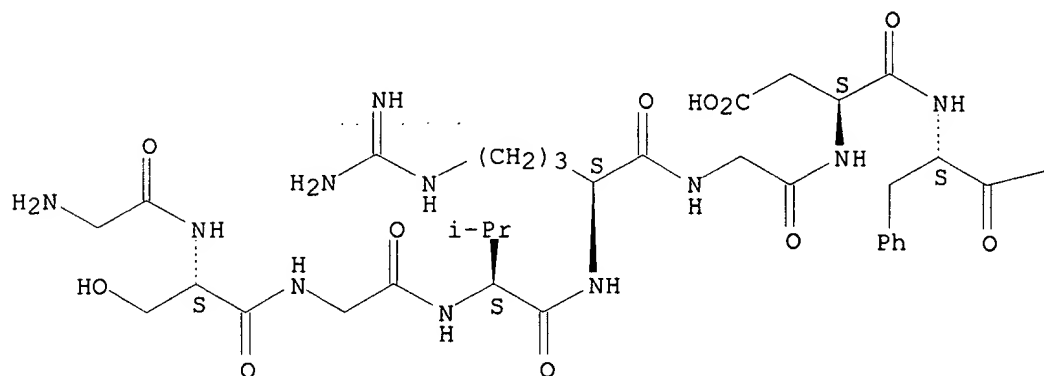
study, unclassified); PRP (Properties); BIOL (Biological study)  
 (retro-inverso peptide corresponding to GH loop of  
 foot-and-mouth disease virus elicitation of protective  
 neutralizing antibodies in relation to vaccine)

RN 164259-71-6 HCAPLUS

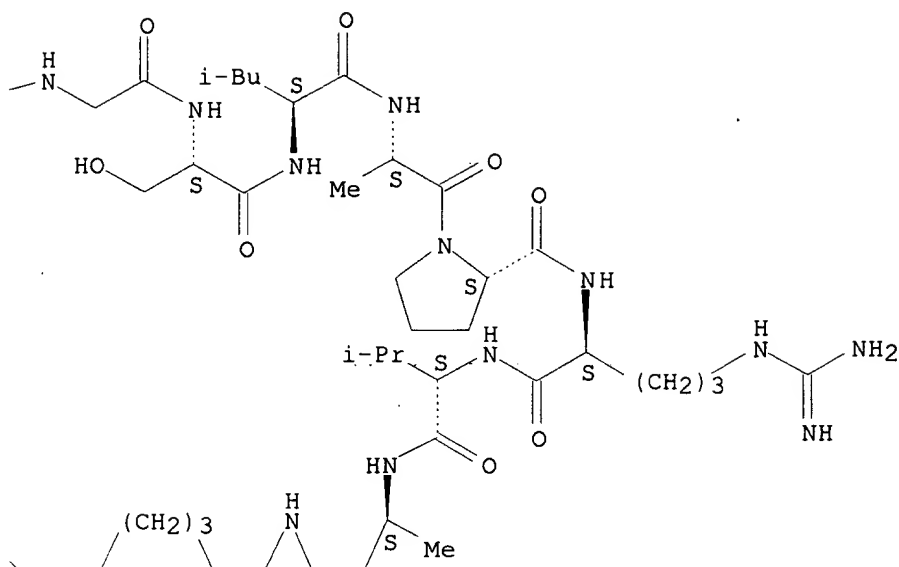
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 L-phenylalanylglycyl-L-seryl-L-leucyl-L-alanyl-L-prolyl-L-arginyl-L-valyl-  
 L-alanyl-L-arginyl-L-glutaminy- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

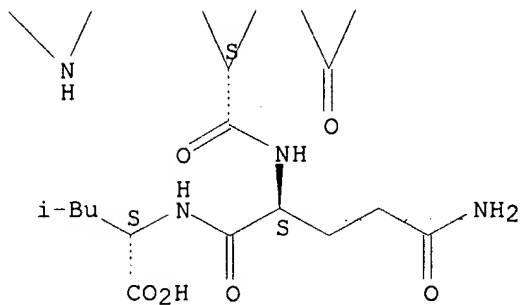
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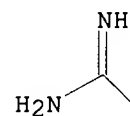
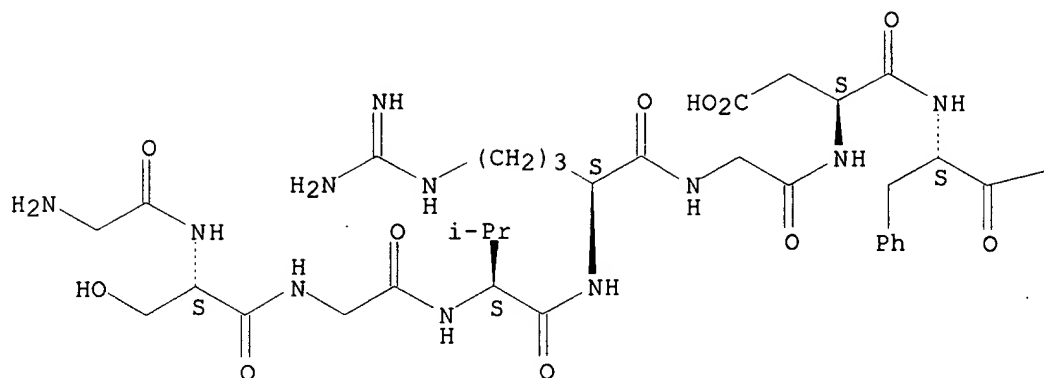


RN 199790-79-9 HCAPLUS

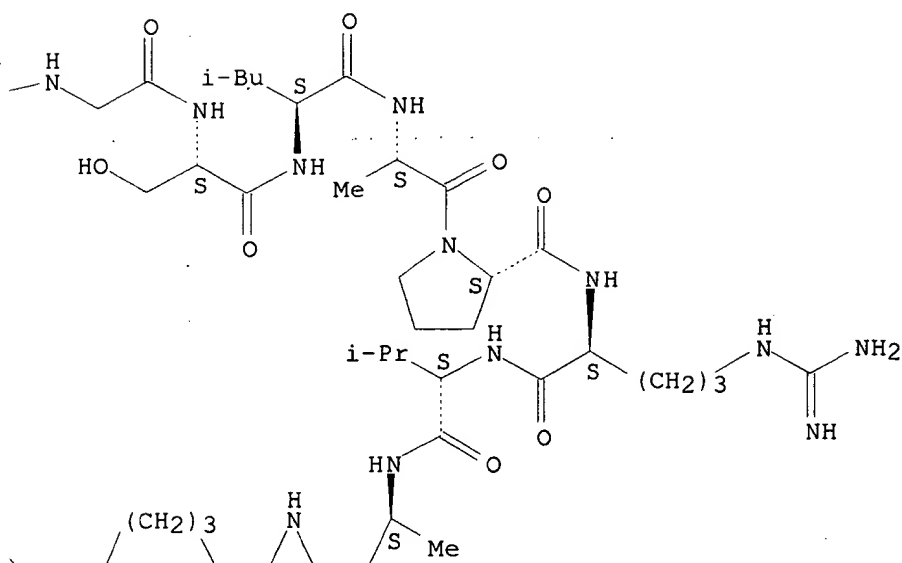
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 L-valyl-L-alanyl-L-arginyl-L-glutaminy-L-leucyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

PAGE 1-A



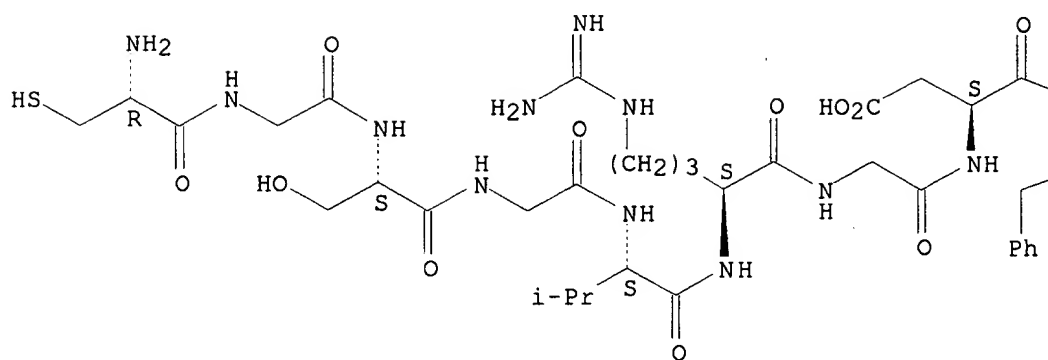
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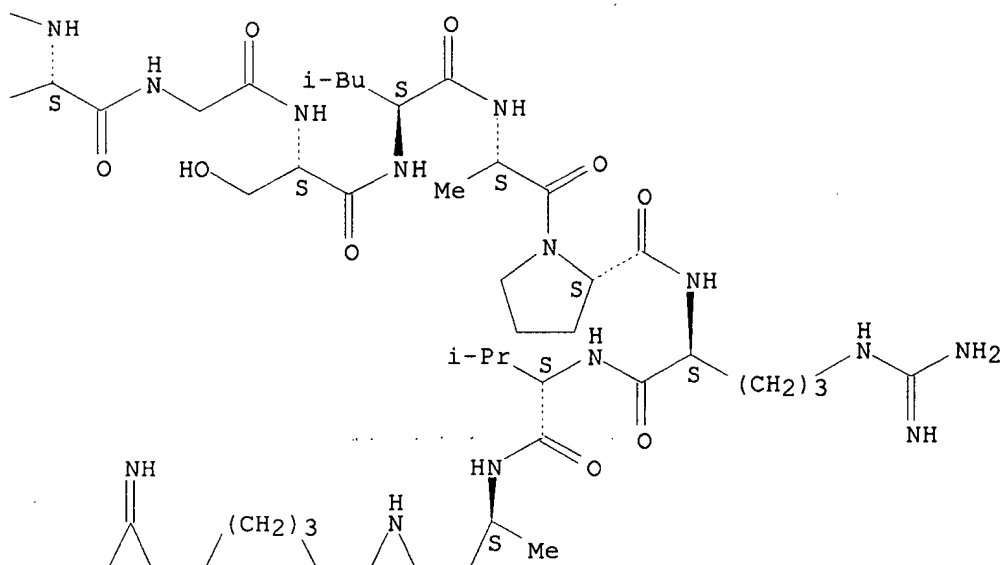
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Absolute stereochemistry.

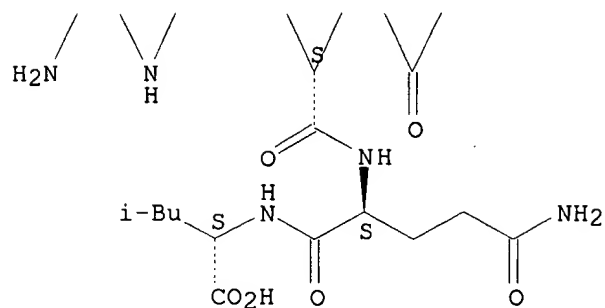
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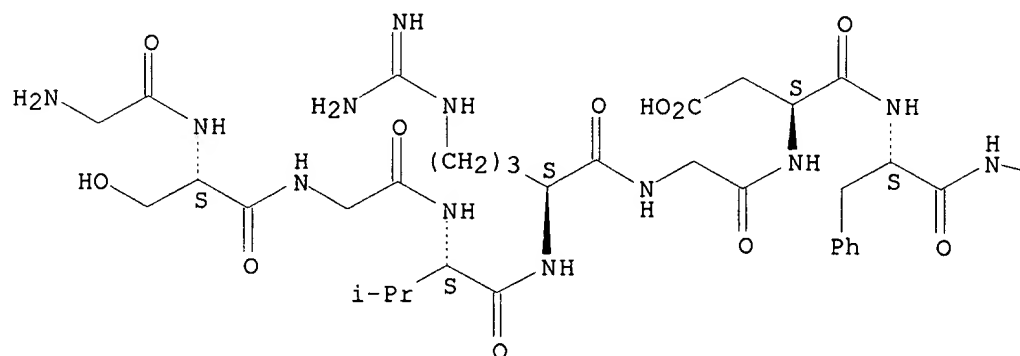


RN 199790-82-4 HCAPLUS

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 aspartyl-L-phenylalanylglycyl-L-seryl-L-leucyl-L-alanyl-L-prolyl-L-arginyl-  
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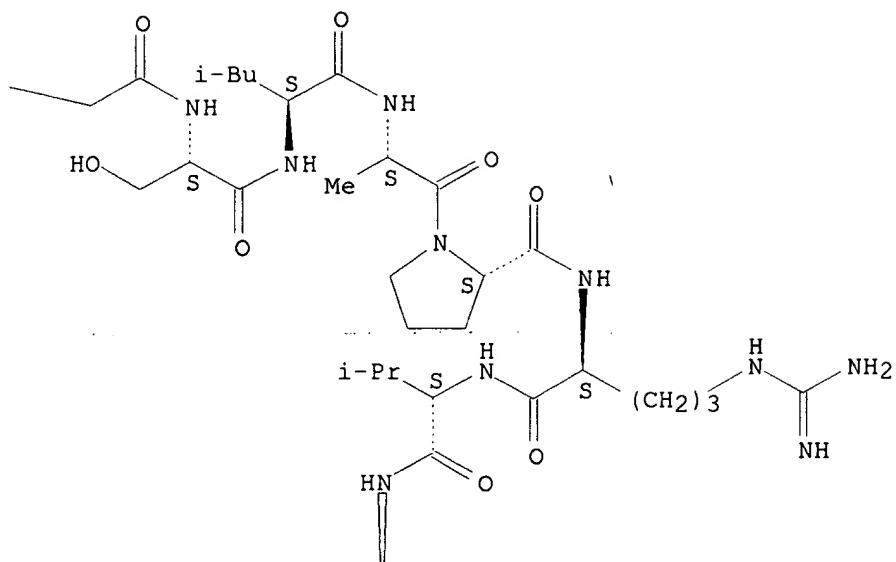
Absolute stereochemistry.

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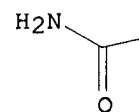
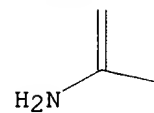


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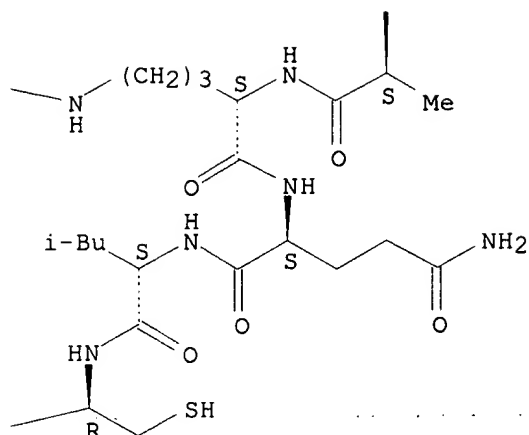
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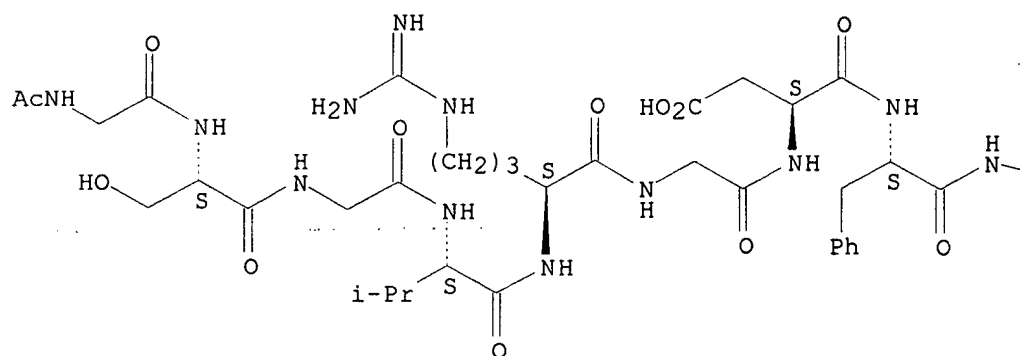


RN 199790-83-5 HCAPLUS

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Absolute stereochemistry.

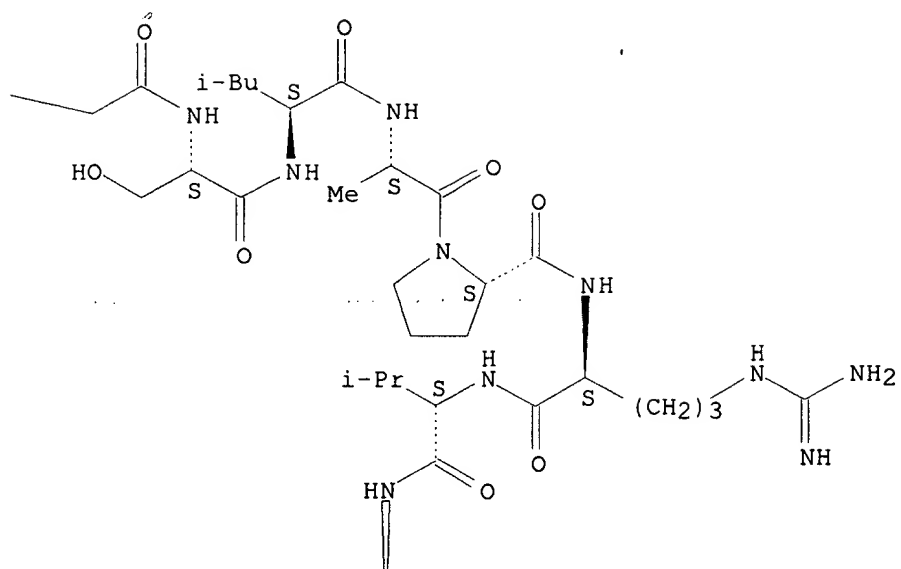
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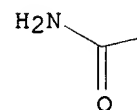
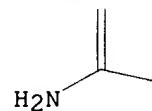
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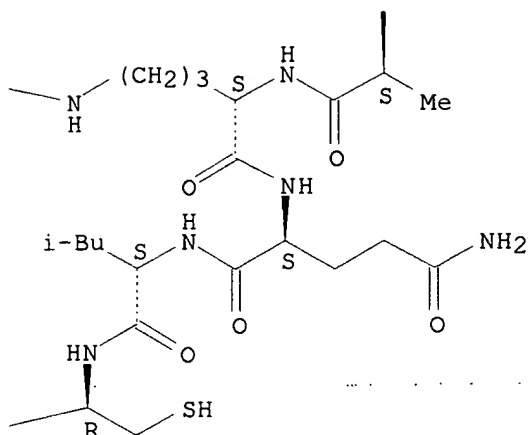
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PAGE 2-A



PAGE 2-B

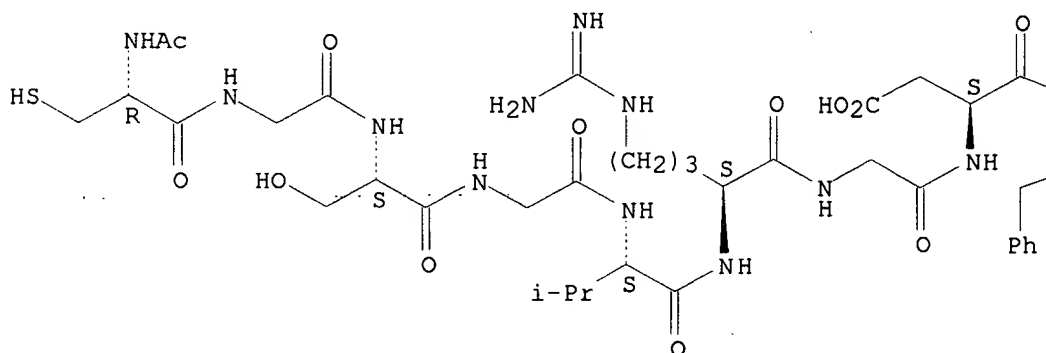


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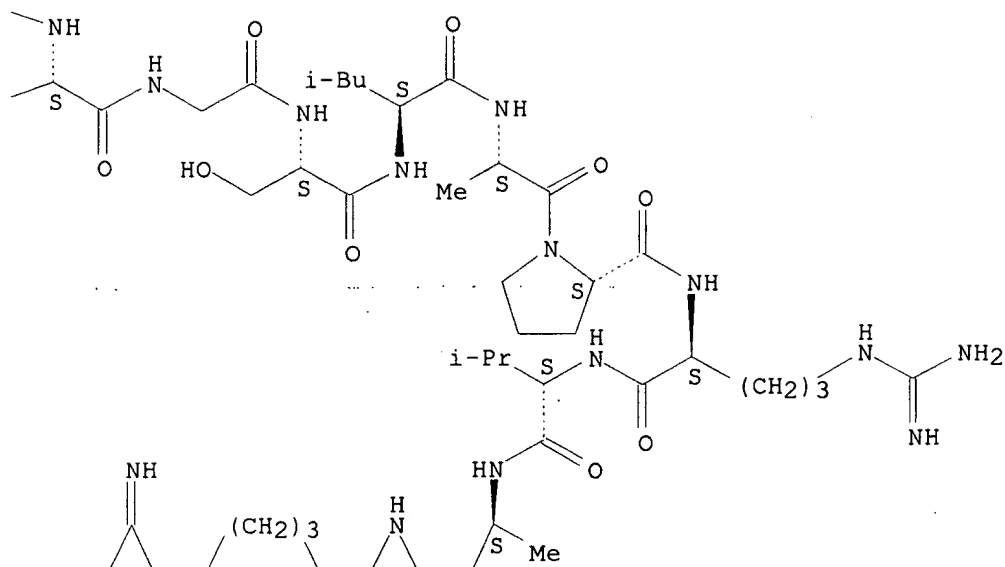
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(CA INDEX NAME)

Absolute stereochemistry.

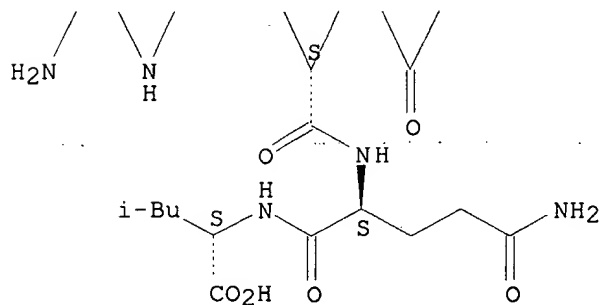
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REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:431945 HCAPLUS

DOCUMENT NUMBER: 127:175078

TITLE: Antigenic mimicry with an all-D-**retro** peptide corresponding to the immunodominant loop of **foot**-and-mouth disease virus

AUTHOR(S): Muller, Sylviane; Briand, Jean-Paul; Benkirane, Nadia; Guichard, Gilles; Van Regenmortel, Marc H.V.; Newman, John F.E.; Brown, Fred

CORPORATE SOURCE: Institut de Biologie Moleculaire et Cellulaire, UPR 9021, CNRS, Strasbourg, 67084, Fr.

SOURCE: Vaccines 97: Molecular Approaches to the Control of

CODEN: 64ONAJ

Conference

English

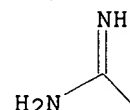
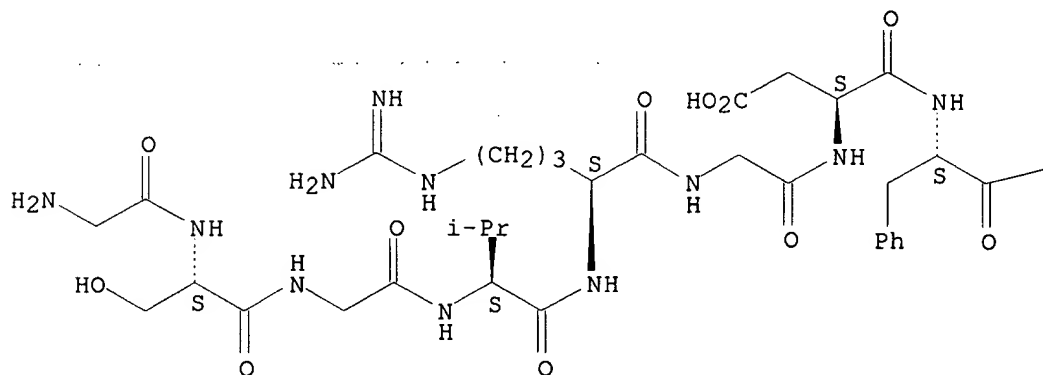
IT 164259-71-6P

(antigenic mimicry with all-D-**retro** peptide corresponding to immunodominant loop of VP1 of **foot-and-mouth disease virus**)

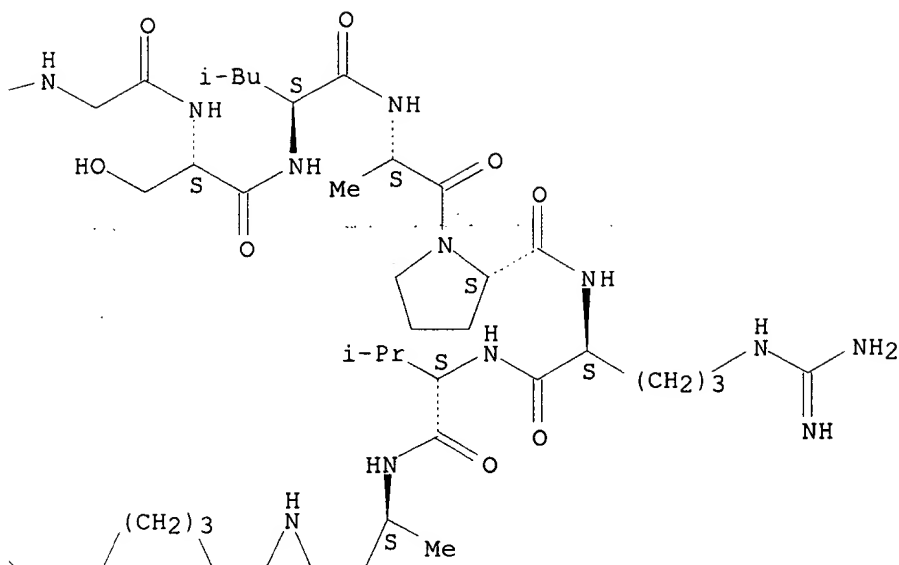
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Absolute stereochemistry.

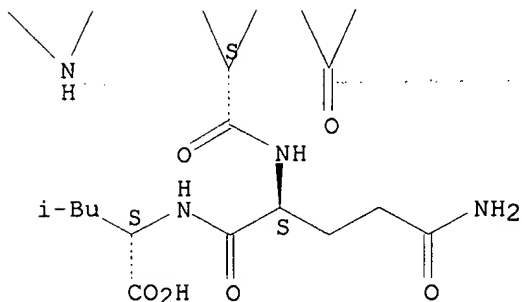
PAGE 1-A



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L11 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1996:697330 HCAPLUS

DOCUMENT NUMBER: 125:325777

TITLE: Mimicry of viral epitopes with **retro-inverso** peptides of increased stability

AUTHOR(S): Benkirane, N.; Guichard, G.; Briand, J. P.; Muller, S.; Brown, F.; Van Regenmortel, M. H. V.

CORPORATE SOURCE: Institut de Biologie Molculaire et Cellulaire, CNRS, Strasbourg, Fr.

SOURCE: Developments in Biological Standardization (1996), 87(New Approaches to Stabilisation of Vaccines Potency), 283-291

CODEN: DVBSA3; ISSN: 0301-5149

PUBLISHER: Karger

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Two major limitations to the use of peptides as synthetic vaccines are their poor immunogenicity and low antigenic cross-reactivity with the epitopes of virus particles. Recently it has been shown that **retro**-inverso peptides corresponding to an immunodominant epitope of **foot**-and-mouth disease virus (FMDV) are able to mimic the structure and antigenic activity of natural L-peptides. A series of L- and **retro**-inverso peptides of the loop 141-159 of the VP1 protein of FMDV has been synthesized. Antibodies to these peptides were produced by injecting rabbits with peptides covalently coupled to small unilamellar liposomes contg. monophosphoryl lipid A as adjuvant. The **retro**-inverso peptides led to higher serum antibody titers which appeared earlier after the start of immunization and lasted longer than those found with L-peptides. Antibodies to **retro**-inverso peptides cross-reacted strongly with L-peptides and with virus particles, while guinea pig antisera to VP1 protein and virions cross-reacted strongly with the **retro**-inverso peptides. In view of their increased stability compared to natural L-peptides, **retro**-inverso peptidomimetics have considerable potential as synthetic viral vaccines.

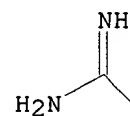
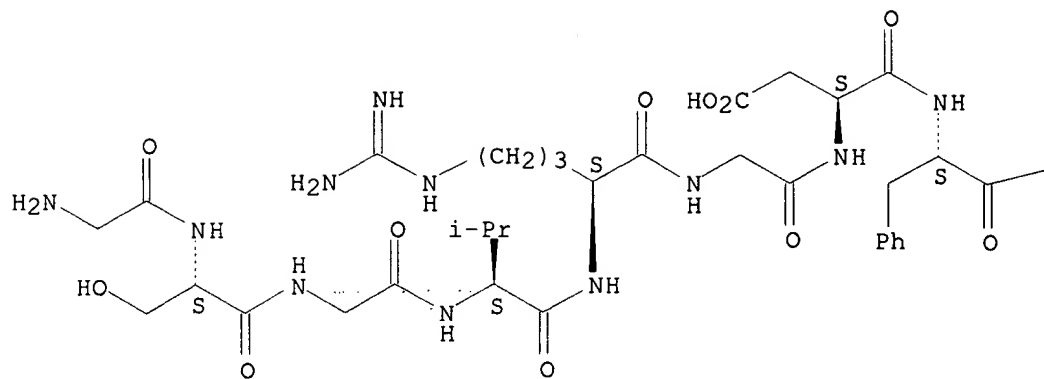
IT **164259-71-6DP**, albumin conjugates **164259-71-6P**  
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); PROC (Process)  
(mimicry of viral epitopes with **retro**-inverso peptides of increased stability)

RN 164259-71-6 HCAPLUS

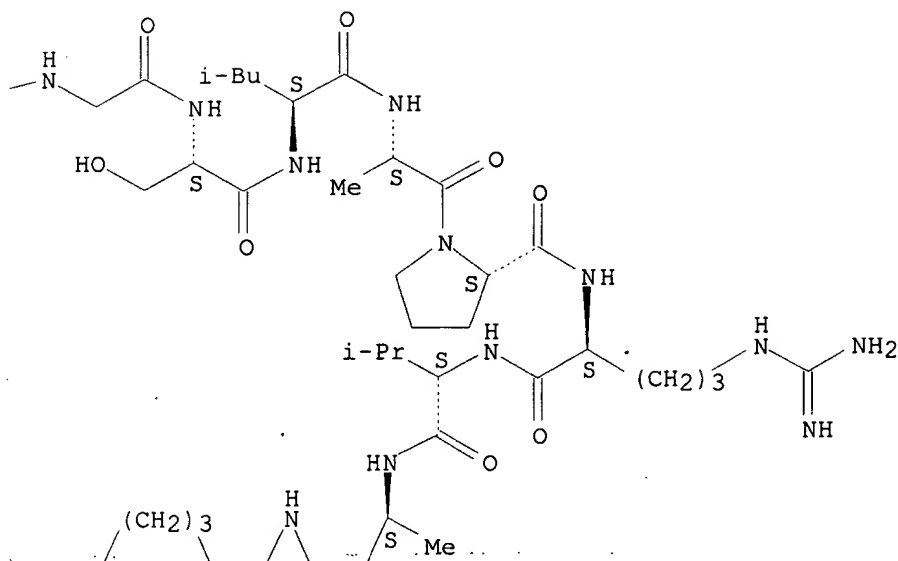
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Absolute stereochemistry.

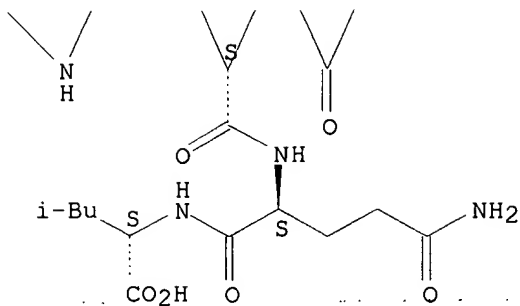
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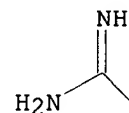
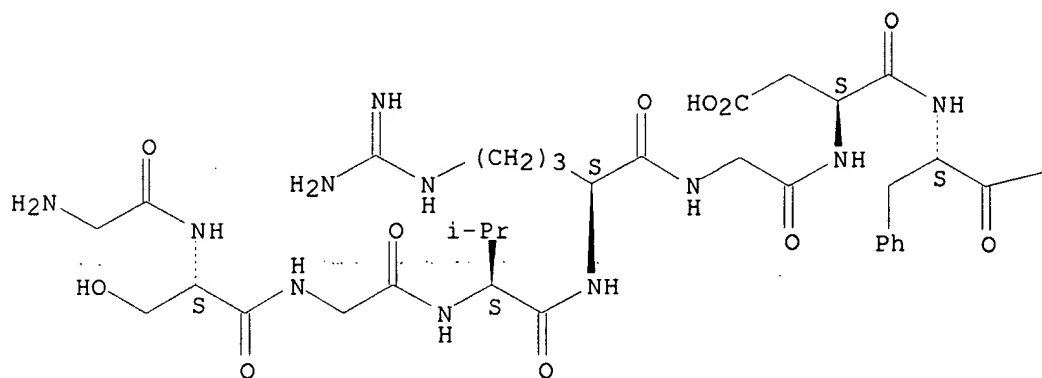


RN 164259-71-6 HCAPLUS

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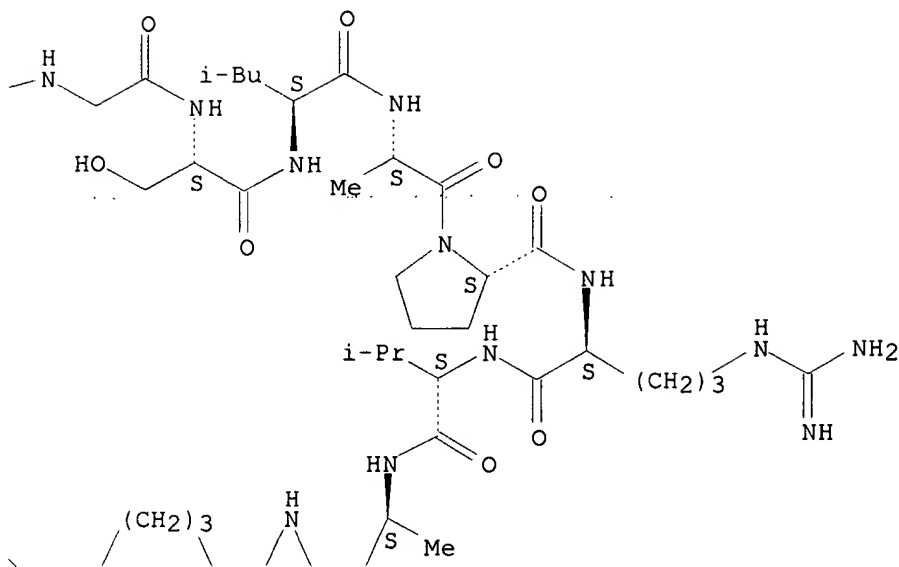
Absolute stereochemistry.

PAGE 1-A

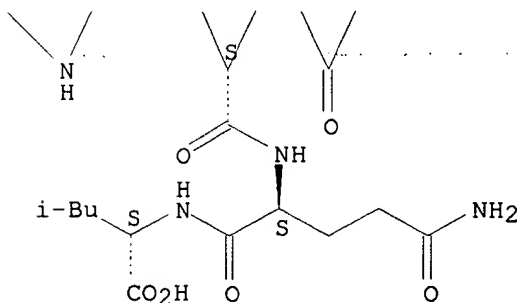




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L11 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1996:696116 HCAPLUS

DOCUMENT NUMBER: 126:6019

TITLE: Use of **retro**-inverso pseudopeptides for mimicking antigenic sites and as potential synthetic vaccines

AUTHOR(S): Guichard, G.

CORPORATE SOURCE: Institut de Biologie Moleculaire, Strasbourg, F-67084, Fr.

SOURCE: Peptides: Chemistry, Structure and Biology, Proceedings of the American Peptide Symposium, 14th, Columbus, Ohio, June 18-23, 1995 (1996), Meeting Date 1995, 827-828. Editor(s): Kaumaya, Pravin T. P.; Hodges, Robert S. Mayflower Scientific: Kingswinford,

UK.

CODEN: 63NTAF

DOCUMENT TYPE:

Conference

LANGUAGE:

English

AB Peptides are attractive for the design of pot. synthetic vaccines. However, they are usually poorly immunogenic with limited cross-reactivity between peptide and viral epitopes. To study the usefulness of **retro**-inverso pseudopeptides as alternatives in synthetic vaccines, the author analyzed the immunodominant epitope of VP1 of **foot**-and-mouth disease virus.

IT 164259-71-6

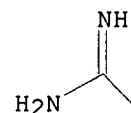
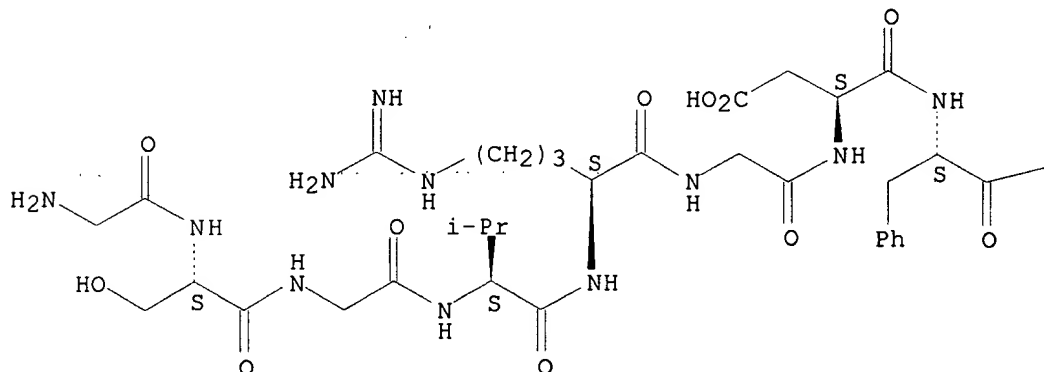
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)  
(antibody binding to **retro**-inverso pseudopeptides of **foot**-and-mouth disease virus VP1 epitope)

RN 164259-71-6 HCAPLUS

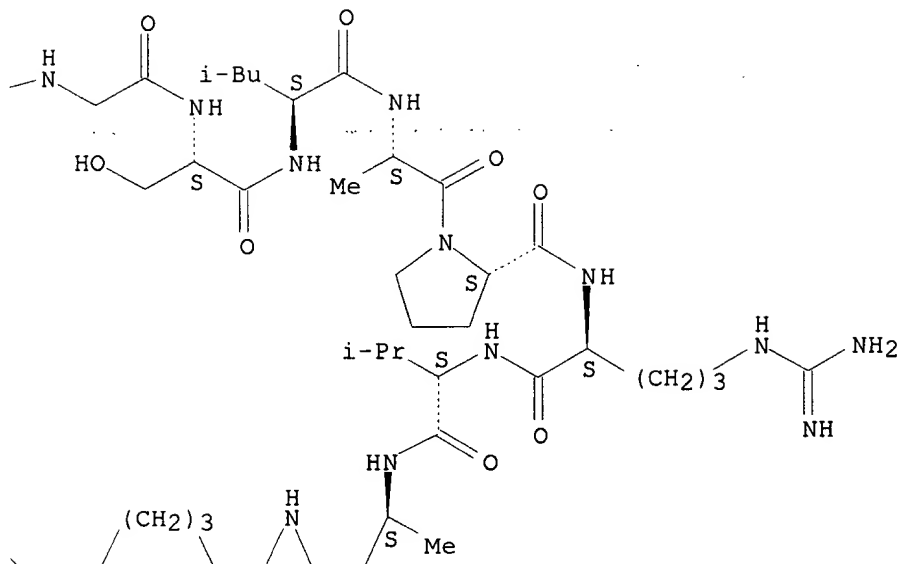
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Absolute stereochemistry.

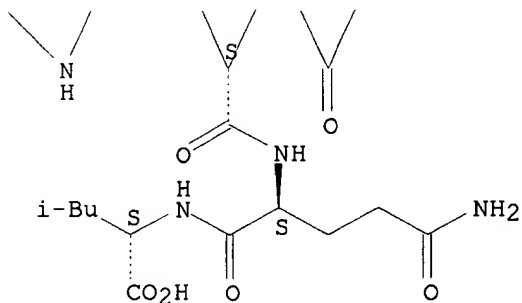
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ACCESSION NUMBER: 1995:617257 HCAPLUS

DOCUMENT NUMBER: 123:53787

TITLE: Enhanced immunogenicity and cross-reactivity of  
**retro**-inverso peptidomimetics of the major  
 antigenic site of **foot**- and mouth disease  
 virus

AUTHOR(S): Muller, S.; Guichard, G.; Benkirane, N.; Brown, F.;  
 Van Regenmortel, M. H. V.; Briand, J. P.

CORPORATE SOURCE: Institut de Biologie Moleculaire et Cellulaire, CNRS,  
 Strasbourg, Fr.

SOURCE: Peptide Research (1995), 8(3), 138-44

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DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB **Retro**-inverso analogs of peptides corresponding to the major antigenic site 141-159 of VP1 from two **foot**-and-mouth disease virus variants have been synthesized and tested for their antigenic and immunogenic properties. Antibodies to the L- and **retro**-inverso peptides were produced by injecting rabbits with peptides covalently coupled to small unilamellar liposomes contg. monophosphoryl lipid A as adjuvant. When compared to the antibody response raised against the L-peptides, the duration of the IgG response that was induced by the **retro**-inverso peptides was significantly longer and the titer of anti-peptide antisera was much higher. Antibodies to **retro**-inverso peptides cross-reacted equally well with the resp. parent L-peptides. These results, obtained with a viral sequence which was found previously to represent a good candidate for possible vaccination, show that **retro**-inverse peptidomimetics could be useful for enhancing the immunogenicity of peptides.

IT 164259-71-6

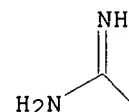
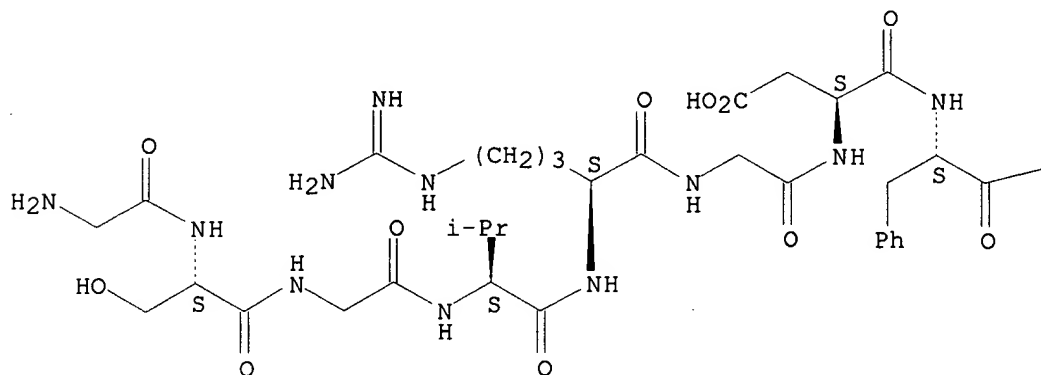
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)  
 (antigenicity and immunogenicity of **retro**-inverso peptidomimetics of **foot**-and-mouth disease virus VP1 peptides)

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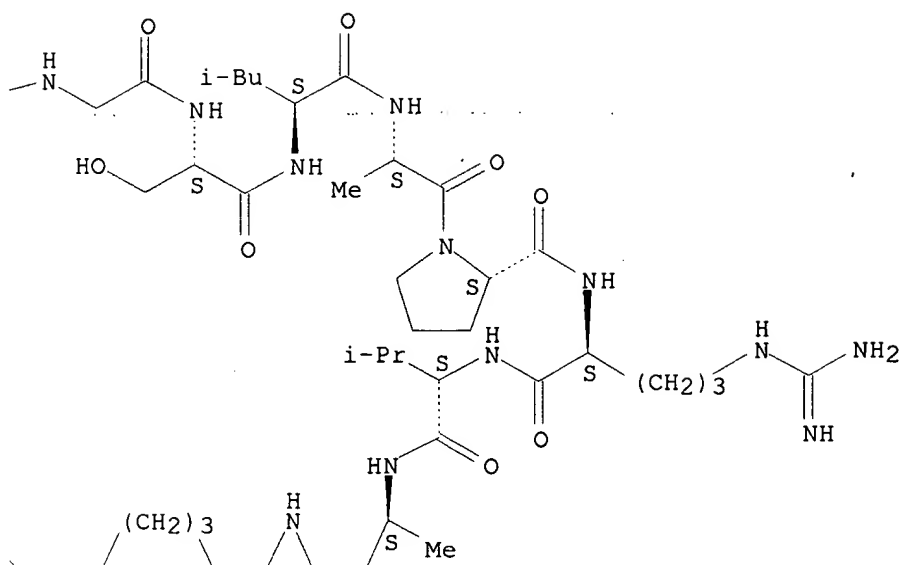
CN L-Leucine, glycyl-L-serylglycyl-L-valyl-L-arginylglycyl-L-.alpha.-aspartyl-L-phenylalanylglycyl-L-seryl-L-leucyl-L-alanyl-L-prolyl-L-arginyl-L-valyl-L-alanyl-L-arginyl-L-glutamyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

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